Title

Talent development in football: The early specialized bird catches the worm!

Authors/Affiliation

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Abstract

Introduction

The identification and development of young football talents has become one of the most extensive research topics within sport science over the last decades. Whilst talent identification pursues the goal of recognizing young players with the potential to become elite athletes, talent development deals with an appropriate learning environment for these promising players (Williams & Reilly, 2000).

The essential role of sport participation from an early age on seems to be unquestionable within the process of talent development. Though this consensus statement, there is a major debate on the contents within this *early sport participation*: Is an initial phase with *sampling* through various sporting activities superior to an *early specialization* in a sport-specific domain (Ericsson, Krampe & Tesch-Römer, 1993; Côté, Baker & Abernethy, 2007)? The most important question related to this discussion is whether transfer effects throughout different sports and the postulated increase in intrinsic motivation from *sampling* can compensate or even overshoot the loss in sport-specific practice volume? According to this topic, the significant impact of early sport-specific practice (up to 12 years of age) on adult performance levels has already been shown in junior national team players of the Swiss Football Federation (Zibung & Conzelmann, 2013).

Regarding the late adolescence, participating in elite youth football development programs (e.g. youth football academies or junior national teams) becomes more and more relevant for reaching elite levels in adult football. For example, almost 90% of all German Bundesliga players (seasons 2009/2010 to 2011/2012) have been involved in a youth elite academy for at least one season and around 60% of German U19 national team players become first league players (Güllich, 2014). In addition to the findings of Zibung and Conzelmann (2013), which dealt with the pathway from elite youth football to the adult level, it would therefore be interesting to know if sport-specific practice in the initial phase of the sports career also boosts the chances to even participate in elite youth football development programs. For that reason, the following contribution investigates the research question if Swiss junior national team football players made more sport-specific experiences up to 12 years of age than their less successful peers.

Methods

The sample consists of 294 talented football players from several regional youth squads throughout Switzerland (including 57 players with at least one nomination for the U15-U18 Swiss national teams; 19.4%). All of them were born in 1999 and have been part of the longitudinal study *talent selection and talent development in Swiss football*, which collects data from different dimensions to describe talent development holistically (e.g. motor performance, psychological aspects, external support).

Referencing to prior contributions within development-related issues in general and talent development in football respectively, a *person-oriented approach* is used for data analysis (Bergman & El-Khouri, 2003; Zibung & Conzelmann, 2013). This approach is about searching for the most promising constellations of several variables within persons, which enables the opportunity of a non-linear compensation for weaknesses between single characteristics, compared to the *variable-oriented approach* and its aiming for correlations between single predictor variables and success. As the *person-oriented approach* requires a set of variables, the operationalization of the *early sport participation* was determined through four variables: (1) volume of organized in-club football practice, (2) volume of free play within football, (3) volume of sports activities besides football and (4) the age at initial football club participation. All of them were collected with retrospective questionnaires, which asked the participants to report their sport behavior until the start of the longitudinal study at 12 years of age. Whenever participants have to cover a long period of time within retrospective questionnaires, absolute values are of critical quality. On the other side reliability and validity have been proven to be acceptable, at least for well-remembered events (e.g. volume of practice; Hopwood, 2015).

The four above-mentioned variables defining the *early sport participation* were analyzed with the LICUR method (Bergman & El-Khouri, 2003). As common in person-oriented studies, this method uses a cluster analysis to group participants with similar variable constellations (Ward procedure; squared

Euclidean distance). An initial analysis of residues led to the exclusion of 4 cases with unique variable constellations. After determining the number of clusters using the guidance by content and the elbow criterion, a partitioning cluster analysis was carried out to optimize the homogeneity within each cluster. Subsequent *transition analysis* deals with the identification of extraordinary successful groups. The number of transitions from each cluster to the U15-U18 Swiss national teams is counted and checked for significant differences compared to the expected numbers by means of a significance test based on the Fisher test and a binomial distribution ($p < .05$). All of this statistical procedures have been carried out using the statistical package SLEIPNER (Bergman & El-Khouri, 2002) and follow the recommendations for person-oriented studies (Bergman & El-Khouri, 2003; Bergman, Magnusson & El-Khouri, 2003).

Results

According to the total number of accumulated hours of practice and activities during *early sport participation* up to 12 years of age, Table I gives an overview throughout the entire sample. Sport-specific in-club practice only accounts for about 20% (1128h) of the total sports activity. The remaining 80% are almost equally split between free play (2058h) and activities besides football (1837h).

Table I. Descriptive statistics for the *early sport participation* (up to 12 years of age).

		early sport participation							
		in-club practice (hours)		free play (hours)		sports activities besides football (hours)		age at initial club participation (years)	
		M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Overall	(*n* = 290)	1127.9	355.0	2058.3	1055.4	1836.7	1060.2	6.3	1.3
Cluster 1	(*n* = 25)	1304.2	269.7	4257.8	1404.4	1968.5	830.4	5.5	0.7
Cluster 2	(*n* = 56)	1602.4	229.8	1988.5	630.5	1736.9	821.9	5.4	0.9
Cluster 3	(*n* = 106)	1071.5	208.5	1694.9	633.4	1360.4	673.6	5.9	0.9
Cluster 4	(*n* = 42)	1091.1	217.2	2359.2	726.6	3592.7	863.5	6.4	0.7
Cluster 5	(*n* = 61)	743.2	202.6	1645.2	811.8	1493.0	721.0	7.9	1.2

The cluster analysis extracted a five pattern solution (cf. Table I, Figure I). Regarding the homogeneity coefficient (*HC*), clusters 2-5 show satisfactory values. Only cluster 1 seems to be somewhat critical. Despite reporting a huge amount of free play, some of this clusters cases could obviously prove consistency with the total sample by withstanding residue analysis.

As a consequence, the just mentioned cluster 1 is basically characterized by a huge amount of free play, which is around two standard deviations higher than average. In combination with a slightly increased amount of in-club practice, these *Football enthusiasts* show the highest number of sport-specific experiences overall. The 2nd cluster unites *Club players* with the earliest initial club participation and subsequent the highest amount of in-club practice. The largest group of *Average players* with barely any special characteristics was found in cluster 3. *Poly-sportive players* of cluster 4 have mostly focused on activities besides football, whereas *Football abstainers* (cluster 5) started their career later than their peers and didn´t participate that much in specific practice.

Regarding the transition analysis, two clusters show significant changes from expected values: *Football enthusiasts* have a 2.0-times increased chance to become selected for one of the U15-U18 Swiss national teams ($p < .05$). A significant lower chance to be selected has the group of *Football abstainers* (0.4-times; $p < .05$). Between this most and least successful groups do *Club players* (1.5-times), *Average players* (0.9-times) and the *Poly-sportive players* (0.8-times) not show any significant deviations from expected transitions.

Discussion/Conclusion

Based on the findings that a group of *Football enthusiasts* with the most sport-specific practice up to 12 years of age shows superior chances to be selected for junior national teams in Switzerland, the crucial role of early specialization within a sport-specific domain seems to be supported. In addition, the opposite cluster of *Football abstainers* with the least football practice has significantly reduced chances to get an essential support from this elite youth development program.

Referencing to Zibung and Conzelmann (2013), fifteen years between the researched cohorts and the shift to a different level of talented players did not lead to any fundamental changes in terms of answering the present research question: sport-specific practice within *early sport participation* seems to be favorable. Although absolute values of the amount of practice have changed (more specific in-

club practice and less free play in the present group), cluster analysis extract similar solutions in both samples. In fact, this supports the stability of the findings and the suitability of the used methods.

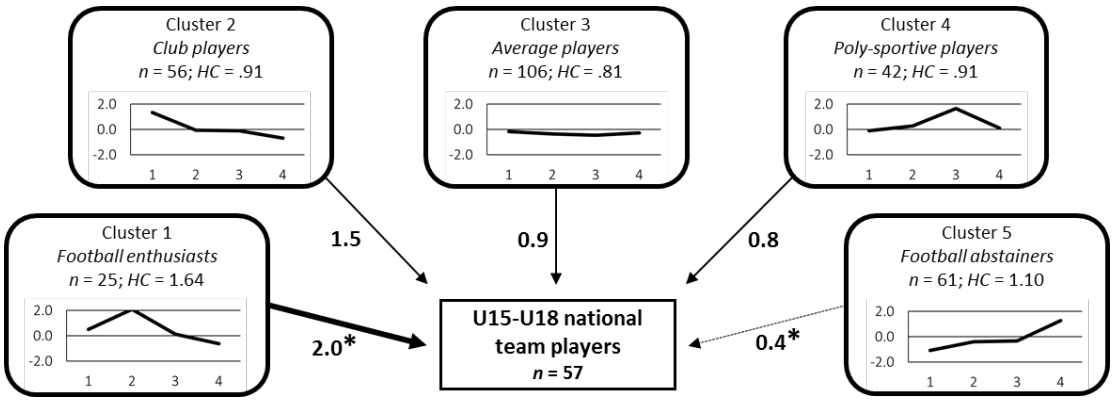

Figure 1. The resulting five clusters, their *z*-score profiles and chances for being selected to U15-U18 Swiss national teams (transition probability as multiple of the expected values; *$p < .05$; variables: 1 = in-club football practice; 2 = free play within football; 3 = sports activities besides football; 4 = age at initial football club participation; *HC* = Homogeneity coefficient, which gives the average squared Euclidean distance within a cluster).

Although the practical implication of the present research definitely recommends sport-specific practice within *early sport participation*, this should not be understood as a claim for focused and sometimes monotonous deliberate practice. Quite the contrary, the most successful cluster of *Football enthusiasts* with its extraordinary amount in free play supports the hypothesis that a broad range of forms (e.g. different versions of football as futsal or beach soccer) and settings (e.g. free play or organized in-club practice) within early sport-specific football practice may lead to superior performance in the later career. Time will show if these consequences overlap with the shortly reconceptualized understanding of the *sampling hypothesis*. Côté and Erickson (2015) kept it open if *sampling* may not only mean participating in different sports, but also in different forms respective settings within the same sport. In the latter case the end of the *sampling vs. specializing debate* could be close, because former opposite counterparts would meet somewhere in the middle.

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